



A perspective validation on pharmacognostic & pharmacological view of tinosporacordifolia

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Abstract

Throughout India, *T. cordifolia* (Guduchi) is an evergreen shrub of glabrous, glabrous foliage which bears a weak and fleshy stem. Ayurvedic and folk medicine systems use this plant extensively. It contains a variety of chemical constituents, including alkaloids, diterpenoid lactones, glycosides, steroids, sesquiterpenoid compounds, phenolics, aliphatic compounds, and polysaccharides. *Tinosporacordifolia* is discussed in this article for its chemical constituents and its pharmacological effects. An Ayurvedic herb known as *Tinosporacordifolia* is commonly used. The review article on this plant is a compilation of all the latest information on its phytochemical and pharmacological activities that have been conducted by a variety of methods, although review articles have already been published on this plant. This compound has hepatoprotective, immunomodulatory, anti-neoplastic, anti-spasmodic, antimalarial, antiinflammatory, antiarthritic, anti-oxidant, anti-allergic, anti-stress, and anti-leprotic properties in addition to anti-diabetic, antispasmodic, antimalarial, anti-inflammatory, antiarthritic, and anti-leprotic properties.

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INTRODUCTION

A phytomedicine is a procedure involving the preparation of herbs for treatment in a specific quantity in a way that minimizes side effects and integrates better with the body of the patient. Because antibiotics or analgesics were not available in the twentieth century, herbal medicine was the predominant form of medication. With the increasing use of allopathic medicine, herbal medicine gradually lost its popularity because of its fast therapeutic action. However, it has regained popularity and has proven to be more effective than synthetic drugs¹.

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Tinosporacordifolia Biodiversity :

As well as Guduchi/Amrita, *Tinosporacordifolia* (Wild Hook) is also known as *Tinosporasinensis*(Lour.) Merr. f. Except haloya, which is considered a weed in Hindi, the name *Tinospora* is used by English and Hindi speakers. As a member of the Menispermaceae family, it belongs to the genus *Menispermaceae*

The plant is found in Myanmar, Sri Lanka, and China and is effective against a variety of diseases and disorders, including jaundice, rheumatism, urinary disorders, skin problems, diabetes, anemia, inflammation, and even boosting energy levels. It is effective in treating infections, heart disease, leprosy, rheumatoid arthritis, helminthiasis, and other diseases. It also supports the structure, function, and levels of white blood cells. Hepatitis and constipation are also helped by it, as well as indigestion, hemorrhoids, and even liver disorders. Here is a review of the pharmacological response to the active constituents of the compound based on phytochemical analysis, separation methods, and pharmacological analysis of the active constituents.

2.1 PHARMACOGNOSTIC CHARACTERISTIC³:

There are numerous coiled branches on this enormous deciduous climbing shrub, which has a creamish brown to dark brown stem powder. Its distinctive flavor is bitter and it is used in dyspepsia, fevers, and urinary diseases. It is called "Guduchi-satva" when it is extracted from the stem."

- **Leaves:** The leaves of this plant are three types: simple, alternate, long-petioled (about 15 cm), round, pulvinate, heart-shaped, partially twisted halfway. The lamina is ovate, 10-20 cm long, and has seven nerves at the base, as well as membranes covering it.
- **Flowers:** Unisexual flowers are found in clusters. Male flowers are clustered, females are usually solitary. Leaflet branches are 2-9 cm long with greenish yellow coloring. In the winter, it produces fruits, while in the summer, it produces flowers.
- **Roots:** In aerial roots, the primary structure is tetra to penta arch, characterized by a thread-like, aerial, squairshin root.

Seeds : In addition to the curved shape of the seeds, the endocarp is ornamented in various ways, allowing identification of the species.

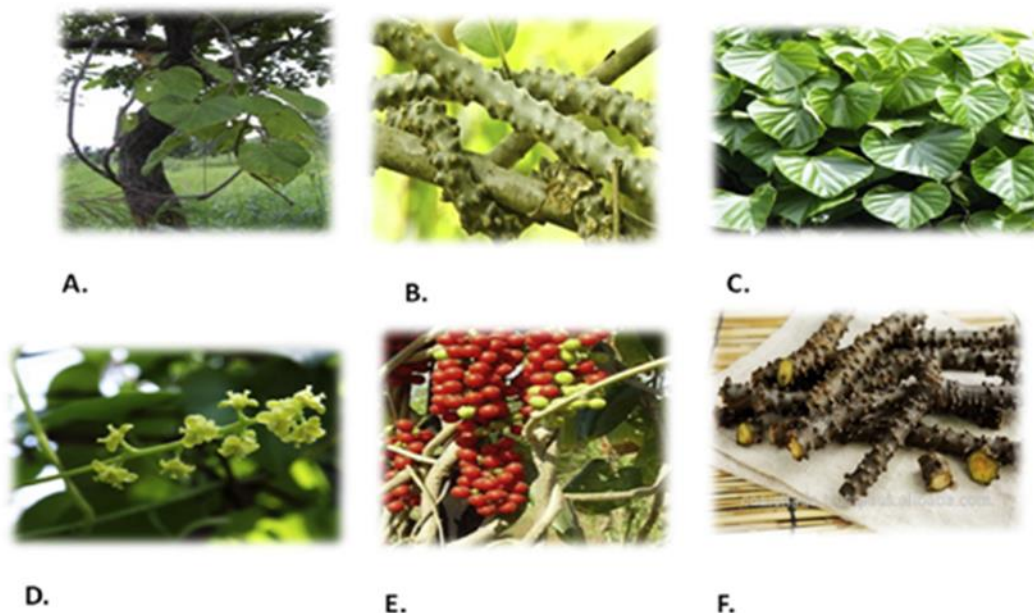


Figure 1: Morphological character of *Tinosporacordifolia*

CHEMICAL CONSTITUENT⁴:

The leaves of *Tinosporacordifolia* The contents contain a high proportion of protein (11.2%), calcium, and phosphorus, and contain a number of different chemical compounds, including alkaloids, glycosides, phenolics, steroids, polysaccharides, and aliphatic compounds.

Diterpeneglucosides (amritosides A, B, C, and D) clerodanefurono make up the stem, and various spectroscopic studies have established their structures. The essential constituents and major constituents of *Tinosporacordifolia* are shown in table1, while a structural diagram of the active ingredient is shown in figure 2.

TABLE 1:List of active Phytocomponent of *Tinosporacordifolia*^{5,6}

Active component	Compounds
Terpenoids	Cordifoliside A, B, C, D, and E, Cordioside, Ecdysterone, Makisterone, Furanolactone diterpene, Furanolactone clerodane diterpene, Furanoid diterpene, Glucosides (isolated as poly acetate), Palmatosides C and F, Phenylpropene disaccharides, Sesquiterpeneglucoside tinocordifoliside, Sesquiterpenetinocordifolin, Tinocordioside, Tinosporaside, Tinosporide
Alkaloids	Alkaloids (jatrorrhizine, palmatine, berberine, tembeterine, choline) 1,2-Substituted pyrrolidine, Berberine, Choline, Jatrorrhizine, Magnoflorine, Tinosporine
Lignans	4-(4-hydroxy-3-methoxybenzyl)-3-(4-hydroxy-3-methoxybenzyl)
Steroids	20 α -Hydroxy ecdysone, β -Sitosterol, Giloinsterol
Others	, Giloin, Heptacosanol, L, sinapic acid, Octacosanol, Tinosporalacetate, Tinosporan acetate, Tinosporidine, Tinosponone

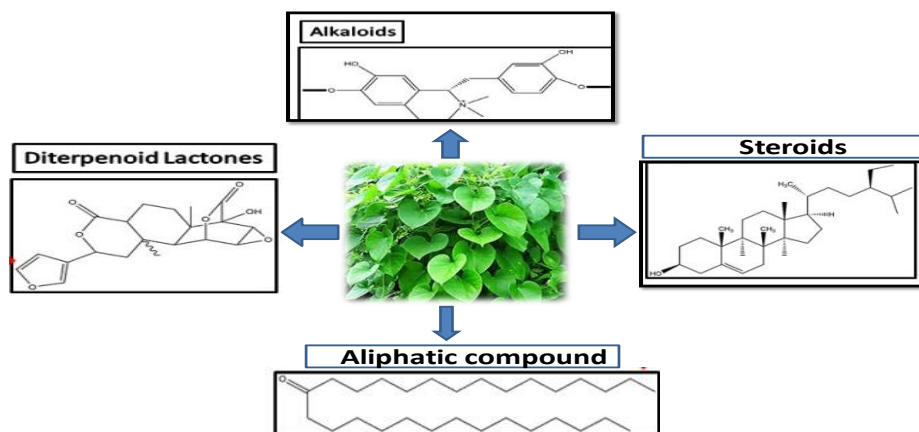


Figure 2: Major phytoconstituent of *Tinosporacordifolia*

Table 2: Biological activities of *Tinosporacordifolia* concerning different parts of the plant.

Active constituent	Biological activity
Terpenoid	Anti-hyperglycemic property, Respiratory tract infection, Skin diseases
Alkaloid	Antioxidant activity, Anti-cancer property
Lignans	Antioxidant activity, Anti-neoplastic property
Steroids	anti-stress, Aerial part of stem:
others	Antidote to snakebite and scorpion sting, Analgesic and neuropharmacological activities, Antipyretic, Antileprotic, Radioprotective, Diabetes, Rheumatoid arthritis, Gout, Cancer, High cholesterol content

3. PHARMACOLOGICAL ACTIVITY [7,8]

An various pharmacological activities of *Tinosporacordifolia* has been reported by the researcher, were its descriptions as follows

3.1 Antimicrobial activity⁹

In-vitro antibacterial activity of thread extracts from *T. cordifolia* has been demonstrated

through various solvent treatments [1]. A positive antimicrobial effect was demonstrated by stem extracts In vitro inhibition of the growth of Gram-positive and Gram-negative bacteria was observed. Below is a list of the antibiotic activity demonstrated by Jeyachandran et al. against infectious diseases.

3.2 Antibacterial activity [10,11]

Table 3: Antibacterial property of *T. cordifolia*

EXPERIMENTAL REPORT	REFERENCCE
The antibacterial activity of plants was evaluated on Escherichia coli, Proteus vulgaris, Salmonella typhi, Salmonella paratyphi, Salmonella typhimurium, Pseudomonas aeruginosa, Enterobacteraerogene, Shigella flexneri, Staphylococcus aureus, Serratiamarcesenses, and several other bacteria.	reported by Narayanan et al.,
A variety of bacteria can be controlled by <i>T. cordifolia</i> , as it contains silver nanoparticles that are antibacterial	Reported by Singh et al.,
Klebsiella pneumonia and Pseudomonas aeruginosa were inhibited by ethanol, acetone, and aqueous extracts of <i>T. cordifolia</i>	Reported by v.shanti .

3.3 ANTI STRESS ACTIVITY:¹²

Sarma et al., reported ethanolic extract of *T. cordifolia* showed significant reduction in all measures of stress when compared with standard drug triazepam (dose 2.5 mg/kg). There was an improvement in patients' I.Q levels based on clinical research. Ayurveda considers it a mind enhancer or Medhya Rasayana, which increases memory and recall.

3.4 ANTI CANCER ACTIVITY:¹³

Based on an investigation by Ali and colleagues in 2010, a response surface methodology (RSM) model was used to examine the effects of *T. cordifolia* extract on animal models. When the extract was given at 200, 400, and 600 mg/kg dry weight, the extract showed anticancer activity against 7,12-dimethylbenz(a)anthracene DMBA induced skin cancer. For 30 days, 750 mg/kg body weight of 50% methanolic *cordifolia* extract was administered to C57BI mice, according to a study that reduced life span due to tumor size. Tetradrilli *cordifolia* extract from 50% ethanol showed significant anti-brain cancer potential in Mishra et al. 's study using C6 glioma cells.

3.5 ANTI HIV POTENTIAL:¹⁴

Researchers discovered that *T. cordifolia* root extract negative effects on HIV patients' immune systems. A reduced number of eosinophils occurs, along with stimulation of macrophages, hemoglobin, and polymorphonuclear leukocytes

to reduce eosinophil counts, *Tinosporacordifolia* stem extract promotes the production of hemoglobin.

3.6 WOUND HEALING PROPERTY:¹⁵

Shanbhag T et al., *Tabernacordifolia* ethanol extract was tested for wound healing profile and its efficacy in suppressing healing when paired with dexamethasone. An incision, an excision, and a dead space wound model were used to assess the wound healing potential of the plant extract. Strengthened *T. cordifolia* is likely to produce more result from collagen synthesis promotion. Extraction of *T. cordifolia* failed to reverse wound healing suppression caused by dexamethasone.

3.7 ANTI OESTROPORESIS ACTIVITY:¹⁶

Abiramasundari et al., reported *T. cordifolia* affects osteoblast differentiation, Mineralization and proliferation in vitro, indicating that it may have antiosteoporotic properties. Several studies have shown that *Tetracordifolia* alcohol extract has anti-inflammatory properties Activate osteoblasts, stimulating their division into the osteoblastic lineage and causing them to mineralize bone-like matrix. Animal studies have reported anabolic and antiosteoporotic This plant has been isolated for its ecdysteroids. According to studies, beta-Ecdysone (Ecd) is generated from a compound extracted from *T. cordifolia* can cause osteoporosis to be relieved in osteoporotic

animals and increase joint cartilage thickness. In addition to being an anti-arthritis and anti-osteoporotic herb, *Tinosporacordifolia* has also been reported to have anti-osteoporotic effects.

3.8 ANTI COMPLEMENTARY AND IMMUNE MODULATORY ACTIVITY:¹⁷

In the study published by *Kapil et al.*, *T. immunoglobulin* coat antibodies inhibited guinea pig serum's hemolysis of sheep erythrocytes in vitro. As a result of inhibiting the classical complement pathway's C3-convertase, immune

hemolysis was reduced. There is substantial evidence that the compounds in *T. cordifolia* stimulate IgG antibody production in guinea pig serums. Incubation time sensitivity of cordioside (TC-2) and cordiofolioside A (TC-5) was determined by increasing the amount of cordiol (TC-7). Different classes of active compounds were isolated and characterized by *Sharma et al.* and their immunomodulatory properties were reported.

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